BTEC Assignment Brief

Qualification	Pearson BTEC International Level 3 Diploma in Building Services Engineering Pearson BTEC International Level 3 Extended Diploma in Building Services Engineering
Unit number and title	Unit 21: Building Services Science
Learning aim(s) (For NQF only)	Learning aim A: Understand the principles of energy, heat transfer and combustion applicable to building services systems
Assignment title	**Heat Transfer and Combustion in Building Services**
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are working as a trainee engineer in a company which specialises in design and installation of building services. The senior management is reviewing the induction and training programme for the new employees and are making number of changes to improve it. One such change is to produce reference documents which contains all the required scientific details including sample calculations. As you achieved very high grades in your BTEC qualification and have demonstrated an excellent attitude towards work, the management considers that you are the appropriate person to undertake this task.
Task 1	Produce the reference documents which will be called 'Building Science in a Box - 1' as detailed below: **a)** Number of posters to demonstrate scientific principles, and their applications, relating to: • Methods of heat transfer and conservation of energy. • Effects of specific heat capacity on materials and components. • Combustion requirements including products of complete and incomplete combustion • Design and performance of installations and equipment with reference to heat transfer and combustion. Please include examples clearly demonstrating the application of these scientific principles. **b)** Sample calculations relating to the following. Please include a step-by-step guide for two of the examples as well. • Conduction through single slab and composite structures

	• Convection through panels and cylindrical objects • Radiation from plane surfaces **c)** A review of (a) and (b) considering the significance and interrelationship of the content covered by 'Building Science in a Box – 1'
Checklist of evidence required	Number of posters as agreed with the assessor using a suitable software. A well referenced word-processed document, using a suitable referencing style such as Harvard. Diagrams/sketches/illustrations to support the calculations Illustrations/sketches to support the discussions Use of credible and range of resources.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria, you must show that you are able to:
A.P1	Explain the methods for calculating heat transfer in conduction, convection and radiation through materials and structures.
A.P2	Explain the principles of fuel combustion and their impact on the design and performance of installations and equipment.
A.M1	Assess the implications of heat transfer and combustion in the design and performance of installations and equipment, taking into account the principles of conservation of energy and combustion of fuel.
A.D1	Evaluate the significance of heat transfer and combustion in the design and performance of installations and equipment, taking into account the principles of conservation of energy, and the combustion and characteristics of fuels.

Sources of information to support you with this Assignment	Burberry, P, *Environment and Services (Mitchells Building Series),* (8th edition), Routledge, 2015, ISBN 9781138167780. This book explains principles of services installations and environmental considerations and is relevant to the content of this unit. Greeno, R, *Building Services Handbook* (8th edition), Routledge, 2015, ISBN 9781138805637. As the name suggests, a handbook covering all aspects of building services in a concise manner. Floyd T. *Electric Circuit Fundamentals*, 8th Edition, Pearson, 2009 ISBN 9780135072936 This book provides practical coverage of electrical circuits supported with number of illustrations. McMullan R. *Environmental Science in Building*, 7th Edition

	Palgrave Macmillan, 2012 ISBN 9780230290808 The most recognised book which is considered a credible text regarding building science. **Journals** *Building Services Engineering Research & Technology (BSERT)*, Sage Publishing This is CIBSE's quarterly journal containing useful research relevant to all aspects of building services engineering. http://journals.sagepub.com/home/bse *P & HE Journal,* Chartered Institute of Plumbing and Heating Engineers (CIPHE) This is CIPHE online journal which covers a broad range of areas relating to plumbing and heating. http://www.ciphe.org.uk/professional-members/publications/ **Websites** http://www.cibse.org/ This is the website of Chartered Institute of Building Services Engineers (CIBSE) which is the professional body for building service engineers. The website contains information about the codes, products and industry updates. http://www.modbs.co.uk/ This is the website of Modern Building Services (MBS) covering a wide range of building services engineering sectors.
Other assessment materials attached to this Assignment Brief	*N/A*